



Wahpe Woyaka pi

(Talking Leaf)

South Dakota Council Teachers of Mathematics Newsletter

Presidential Ponderings

Greetings All!

Anticipation for me grows each year around this time due to the upcoming annual SDCTM/SDSTA conference. Professionally, there is no better destination to gather new ideas, meet new people, renew friendships, and grow your individual teaching practice. The upcoming 26th annual conference promises to be another outstanding event. Make plans to be in Huron February 8-10 for a fantastic professional development experience. The conference will begin with two sharing sessions on Thursday night: one for math, and one for science. The round table discussions are facilitated by leaders from each organization, but your participation is critical for a successful event. I will be hosting the math sharing session, which starts at 7:00 p.m. on Thursday night. If you are not quite sure what a sharing session is, imagine Show and Tell for math teachers of all grade levels. Bring your favorite idea or classroom activity to share with others. Once again, come hungry as there will be Pizza for the people who attend the sharing session.



This year's conference will kick off at 8:05 am on Friday with an opening session featuring an Ignite talk. SDCTM's NCTM Liaison Mark Kreie will talk about "Which One Does Not Belong?" It is guaranteed to be an interesting and fast-paced event. Please plan ahead to complete your conference registration tasks in time to attend.

We are excited to have two Presidential Awardees as featured speakers. Lenny VerMaas will be our middle school/high school Featured Speaker. Lenny has spent his whole career (28 years) in middle school and high school classrooms and recently with Educational Service Unit #6 in Nebraska. Lenny received the Presidential Award for Excellence in Teaching Mathematics in 1998. He has presented at many mathematics, science, and technology conferences. His sessions include No One is Born With A Math/Science Brain - Everybody's Brain can Grow to Learn Math and Science, Inch Boy - Yao Ming and Other Fun Statistics Activities, Who is Doing the Talking in Your Classroom? Using Questioning to Develop Student Understanding, Homework Strategies for the Math/Science Classroom that Engage Students, and How Did You Do That? Number Tricks and Algebra.

Bill Kring will be our elementary Featured Speaker. Bill graduated from Washington State University and earned his MAT from Harvard University. He taught 44 years, 24 at the high school level, 9 at the middle school level, and 11 as trainer and colleague. Affectionately known as the "hot-air man", Bill has spoken at numerous state, regional, and national conferences about using a hot-air (gas) balloon as a model for integer arithmetic. He was awarded the 1992 Presidential Award for Excellence in Mathematics Teaching for the state of Washington and continues to work toward improving mathematics teaching in a variety of settings. His sessions include Decode the Language of Mathematics and Demystify Addition and Subtraction, Decode the Language of Mathematics and Demystify Multiplication and Division, Take a Balloon Ride to Understanding Integer Arithmetic, and A Potpourri of Problem Solving – Part 1 and Part 2.

In addition, with over 100 sessions by South Dakota's outstanding educators to choose from there will be something for everyone to attend. Just a few of the intriguing topics include "The DESMOS Teacher Site: Where Math Meets Amazing", "Using the Flipped Classroom to teach Geometry", "Transform Your Classroom Routine", and "Empowered Problem Solving". Check the website at www.sdctm.org for the official program. Registration and other conference information can also be found online.

continued

WINTER 2017-2018

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Calendar Notes:

- *Marian Fillbrandt Scholarship Application Due January 15, 2018*
- *SDCTM/SDSTA Conference February 8-10, 2018*
- *PAEMST Nominations Due April 1, 2018*
- *PAEMST Applications Due May 1, 2018*



Presidential Ponderings, *continued*

Is your closet full of stuff that you no longer use, but it's too good to throw away? A big success every year, "Share the Classroom Treasures" returns. Bring your excess, good, working equipment or resource materials to the conference. We will be providing a room for you to drop off and give away your things so that other South Dakota teachers with a need can take them to use. (Although it may feel like yours, make sure that it is. If it's marked "School Property", please leave it in school.)

As always, annual awards will be presented at Friday night's banquet as both SDCTM and SDSTA will recognize leaders in mathematics and science education. State Level Finalists for the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) will be honored. The recipients of the Outstanding Math Teacher Award, Friend of Mathematics, and Distinguished Service to Mathematics Award will also be announced during Friday night's banquet. Come celebrate accomplished teaching along with us!!

Allen Hogue
SDCTM President
Allen.Hogue@k12.sd.us

SDCTM/SDSTA Registration Options

This year, there will be two options for advance registration for the 2018 SDCTM/SDSTA Joint Professional Development Conference (JPDC). On-site registration will still be available, but at an increased cost.

Advance Registration Option 1: You may print the conference registration form found online or on page 20 of this newsletter and mail it with your payment to Steve Caron. Advanced registration must be postmarked **January 20, 2018**.

Advance Registration Option 2: You may register on-line with a google form found on the SDCTM and SDSTA websites or by using this link:
<https://goo.gl/forms/JCEHQhabEaF4oE213>
This year, payment through PayPal, will be **required** at the time of **registration**. There will be a \$4 processing fee added to on-line registrations to cover PayPal transaction fees. *The JPDC Executive Board strives to keep costs at a minimum for the conference and thus will need to pass additional fees incurred along to you.*

Please note, **online registration closes January 20, 2018** - all online registrations must be paid by **January 22, 2018** or they *will be canceled*.

On-site registration will continue to be an option, but will be charged a higher rate. Due to changes at the Huron Events Center, meal counts **must** be turned in one week prior to the conference. The registration committee must estimate (and pay for) lunches prior to processing on-site registrations. Consequently, on-site registration will be charged a \$25 late registration fee. *In the past, lunch counts could be turned in as late as 10:00 am each day, and the deadline for banquet meals was Friday at 1:00 pm. New management timelines for meal counts are much more strict.*

"Come celebrate accomplished teaching along with us!"

Registration Deadlines:

- * *Advanced, mail-in registrations—postmarked by 1/20/18*
- * *Advanced, on-line registrations—paid through PayPal by 1/22/18*
- * *Late, on-site registrations—paid onsite & incur a \$25 late fee*



K-5 Corner

I feel like I was just writing the last newsletter article. I can't believe how quickly time has gone. As we are looking at the next half of the school year and planning for learning before testing begins, it is hard not to think about how far we have come and where we need to be by the end of May. I am beginning to look at my little mathematicians and I am realizing that their math ability is present, they are doing well so far and we are moving towards mastering our end of year standards. I am however, realizing that their mindset is where we need to work. Even at a young age, I hear students say "I can't" or "this is going to be too hard" and I wonder why they have acquired this mindset. Have you heard your students get trapped in this place? As we move into the New Year, my goal is not so much academic but mindset. I want to spend the next part of the school year building their self esteem and helping students see that struggle is good and it leads to new learning rather than viewing it as a dead end. We are going to spend more time on CODE.org working on age appropriate CODE activities that will not only teach them about the world of computers, but learning to persevere through challenges and using their problem solving skills to work through the hard problems.

Perseverance and a growth mindset will lead us through our work the rest of this school year!

Merideth Wilkes
SDCTM Elementary Liaison

McCann Scholarship

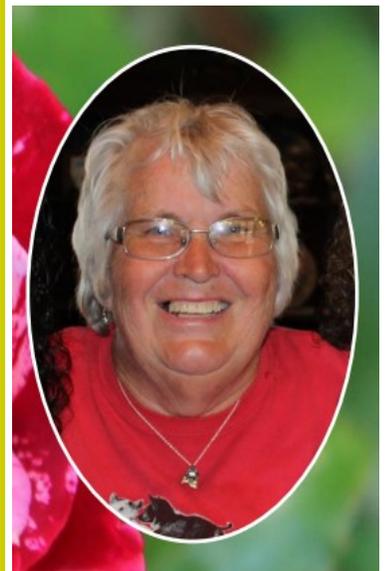
A scholarship in memory of long time SDCTM member and officer Diana McCann has been established for the benefit of college students preparing to become a math teacher. Rising seniors studying math education at any post secondary institution in South Dakota are eligible. The scholarship will be awarded at the annual SDCTM/SDSTA Conference.

Donations to the McCann Scholarship can be sent to:
Security State Bank
1600 Main Street
Tyndal SD 57066.

One hundred percent of all donations will be used to fund the scholarship.



“Even at a young age, I hear students say “I can’t” or “this is going to be too hard” and I wonder why they have acquired this mindset.”





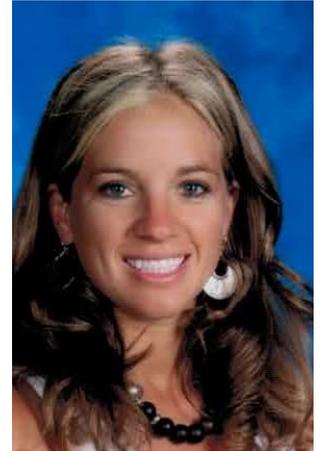
9-12 Spotlight

Mark your calendars for the 26th Annual SDCTM/SDSTA Conference, February, 8th – 10th in Huron, South Dakota. Hope to see a lot of fellow math and science teachers, remember that is YOU Elementary Teachers. You are the most important math and science teachers of all, because you not only lay the foundation for middle school and high school math/science but play an important role in forming students attitudes about these STEM subjects.

I just finished reading Teach like Finland by Timothy D. Walker. In this book, Timothy shares 33 simple strategies for a more joyful classroom. Here is a little more about the book: When Timothy D. Walker started teaching fifth graders at a Helsinki (Finland) public school, he began a search for the secrets behind the successes of Finland's schools. In this book, he gathers all he learned and reveals how any teacher can implement many of Finland's best practices. Remarkably, Finland is prioritizing the joy of learning in its newest core curricula and Walker carefully highlights specific strategies that support joyful K-12 classrooms and integrate seamlessly with education standards in the United States. This book pulls back the curtain on the joyful teaching practices of the world's most lauded school system. His message is simple but profound: these Finnish-inspired strategies can be used in the U.S. Teach like Finland was a good read and I highly recommend the book. The strategy "Vacate on Vacation" is my goal for Christmas Break - I am leaving my gradebook and lessons plans in my classroom as I leave for vacation.

Hope to see you all in Huron in February! Merry Christmas & Happy New Year!

Lindsey Brewer
Lindsey.Brewer@k12.sd.us
 SDCTM Elementary Liaison



"The strategy "Vacate on Vacation" is my goal for Christmas Break - I am leaving my gradebook and lessons plans in my classroom as I leave for vacation. "

Mathematical Christmas Greeting

The picture at left was sent to my husband as part of a Christmas email.

How about challenging your students to write a mathematical greeting for a holiday/special day using the math that they are studying.

Sheila McQuade

$$y = \frac{\log_e \left(\frac{x}{m} - sa \right)}{r^2}$$

$$yr^2 = \log_e \left(\frac{x}{m} - sa \right)$$

$$e^{yr^2} = \frac{x}{m} - sa$$

$$me^{yr^2} = x - msa$$

$$me^{rry} = x - mas$$



Higher Ed Viewpoint

There are a lot of things happening in higher education right now that I would like to bring to your attention.

First of all, the math placement process is being adjusted to allow students with no ACT or GPA, which is typical among many international students, an opportunity to place into calculus with a challenge index (CI). Below is the updated placement policy for your convenience.

If you have

- a current (within 5 years) Math ACT score and High School GPA OR
- a Math ACT or SAT score only (no HS GPA) OR
- score from Smarter Balanced (taken in 11th grade) OR
- an Accuplacer score from the College Readiness Course completed through the SD Virtual HS, your initial placement is the highest placement determined from these scores- see table on page 6. Otherwise, your initial placement will be established when you take the Accuplacer for the first time. If you wish to take Calculus and have a qualifying initial placement, you will take the Accuplacer Calculus exam. If no GPA is available so that one can't calculate an MI or a CI, a College level Accuplacer score ≥ 51 will allow the student to take the calculus readiness exam to see if they can place into calculus.

Students that wish to challenge their academic placement can take the Accuplacer exam and apply the Accuplacer Math Score or the Challenge Index. If the student has an Accuplacer College Level Math score (ACM) the student can apply the Challenge Index (CI) placement where the CI is calculated as $290 * \text{HS GPA} + \text{ACM} + 220$. For a student that challenges placement, the student's placement becomes the higher of the initial placement and the Challenge Placement applying the Accuplacer Math Score or the Challenge Index.

A second item of interest will be that the Board of Regents is having a second reading on a policy that would allow student flexibility for student teaching. If approved it would allow students who complete the approved math programs with 27 credit hours or more to not have to meet the praxis scores to student teach. This is an effort to increase the pipeline of math teachers in our state.

A third item of interest would be that a special committee was formed by the BOR to investigate the future of how we offer developmental math courses at our institutions. The proposal being looked at is to offer co-requisite courses so students receive college credit immediately for their math coursework while getting the support to succeed at the same time as taking those courses. This will be interesting to see where the proposal lands and how it is implemented.

I hope to see you all in Huron in a short while. Please feel free to visit with me about any questions you have about mathematics at our BOR institutions. If I am not able to answer your questions, I should be able to at least put you in contact with those that can. Wishing you all a very Merry Christmas and many blessings in the new year.

Sincerely,

SDCTM Liaison to Higher Education
Professor and Dept. Chair
The University of South Dakota



"...the math placement process is being adjusted to allow students with no ACT or GPA, which is typical among many international students, an opportunity to place into calculus with a challenge index (CI)."



Higher Ed Viewpoint - *continued*

If you have

- a current (within 5 years) Math ACT score and High School GPA OR
- a Math ACT or SAT score only (no HS GPA) OR
- score from Smarter Balanced (taken in 11th grade) OR
- an Accuplacer score from the College Readiness Course completed through the SD Virtual HS,

your initial placement is the highest placement determined from these scores- see table below.

A	B	C	D	E	F
If you want to take	MATH INDEX (MI)	Accuplacer Math Score	Smarter Balanced Score	Only if no HS GPA is available, and thus no MI is available	CHALLENGE INDEX (CI)
MATH 021	250*HS GPA + 17 = MATH ACT Math Index 0 or higher	Accuplacer Math Score Arithmetic 0-120 or Elem Algebra 0-43	0-2542	ACT MATH 1-17 or SAT MATH 1-420	NA
MATH 095	Math Index 0 or higher	Arithmetic 0-120 or Elem Algebra 0-75	0-2627	ACT MATH 1-19 or SAT MATH 1-470	NA
MATH 101 or MATH 102 w/092L or MATH 103 w/093	Math Index 950 or higher	Elementary Algebra 44-75	2628 or higher	ACT MATH 18-19 or SAT MATH 421-470	NA
MATH 102 or MATH 103 or MATH 104 or STAT 281 w/091	Math Index 1150 or higher	Elementary Algebra 76-120 or College Level 0 - 50	NA	ACT MATH 20 or higher or SAT MATH 471 or higher	NA
MATH 115 or MATH 120 or MATH 121 or MATH 281 or STAT 281	Math Index 1300 or higher	College Level 51 or higher	NA	ACT MATH 25 or higher or SAT MATH 570 or higher	Challenge Index 1300 or higher
MATH 123 w/123L	Math Index 1300 or higher AND Accuplacer Calculus 16 or higher	Math Index 1300 or higher AND Accuplacer Calculus 16 or higher	NA	(ACT MATH 25 or higher or SAT MATH 570 or higher) AND Accuplacer Calculus 16 or higher	Challenge Index 1300 or higher AND Accuplacer Calculus 16 or higher
MATH 123	Math Index 1300 or higher AND Accuplacer Calculus 19 or higher	Math Index 1300 or higher AND Accuplacer Calculus 19 or higher	NA	(ACT MATH 25 or higher or SAT MATH 570 or higher) AND Accuplacer Calculus 19 or higher	Challenge Index 1300 or higher AND Accuplacer Calculus 19 or higher





A Word from Nicol

I was struggling to settle on a topic for the newsletter this time, and so I decided to enlist outside help. My daughter is a junior in high school, and I asked her what she thought I should write about for the SDCTM newsletter. Her advice was to focus on how to change things up or add variety in the classroom. Great idea! The routine of the classroom and the doldrums of winter give cause for a little shake up to keep everyone engaged.

- Incorporate physical activity. Sitting all day is difficult for students! (And adults!)
 - * Gallery walks or chalk talks! Have problems posted on the wall and have students go to the problems to solve them so that they can get up and walk around. Be sure to start with a discussion of clear expectations about what success looks like for the activity.
 - * Whiteboard groups! Students solve problems individually on their whiteboard, and then move across the classroom to find others who have solved the same problem to talk about the strategies they used or the challenges they are facing.
 - * Switch-Off! Students work in pairs on a set of problems, but every few minutes students move to where the next pair of students was working. Their job at their new station is to assess what the other pair was using for a strategy, finish that problem with the strategy of the previous pair, and then continue with the rest of the problem set. Students see problems from the perspectives of others and work collaboratively!
- Try some new ways to check for understanding.
 - * Tweet it! Students have to summarize the lesson or concept in 140 characters or less. Have them compare and share their tweets. What a great way to see what learning they are consolidating in their heads!
 - * 3 Truths and a Lie! Students create three truths and a lie about the current concept or topic that you are teaching, or students could create three problems that are true and one that is not true. Then they compare with friends, answer each others' sets, and talk about what they learned.
 - * Confidence Sort! Students can use either topics, types of problems, or types of mistakes that are common and sort them according to how confident they feel about successfully tackling the concept, problem, or mistake. Students could put examples on notecards, sort them, and then write an explanation about their confidence choices. Opportunities for lots of deep thinking happen here!
 - * Traffic Light Self-Assessment! Students assign either red, yellow, or green lights to each of the problems on their practice work or on an assessment before they get feedback or correct it. The reflection will really help students with self-assessment. Perhaps take it another step further and have them write a short summary at the end about how they know what they know and what some good next steps might be. This activity could provide excellent feedback for the teacher as well as the student!



“Her advice was to focus on how to change things up or add variety in the classroom.”



A Word from Nicol - *continued*

- Learn more about your students, and help them learn more about themselves, too! Have reflection prompts for the beginning or end of class, or any time reflection is valuable. Here are some unique questions to use that can be focused around math or left open. Student answers provide great food for thought for teachers!

- * What are we learning that you don't completely understand, yet?
- * Who inspired you today? How?
- * What is something you have learned in mathematics that surprised you?
- * What is something that you saw that really made you think?
- * What is something that challenged you?
- * What was a really great mistake that you made that helped you or others learn?
- * What are you looking forward to?
- * What made you smile in mathematics today?
- * What would you like to share with me?
- * If you could switch seats with anyone in the class, who would it be and why?

Pick a few things and give them a try! I wish each of you the best in 2018!

Nicol Reiner
SD State Math Specialist
Nicol.Reiner@state.sd.us



Share the Wealth

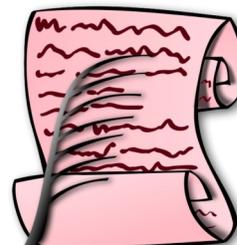
South Dakota Teachers are some of the most creative, dedicated professionals. Whenever I have the opportunity to visit with our teachers, I always hear of a project or lesson idea that I could use in my classroom. I invite you to share your wealth of ideas with our membership. Please consider submitting a favorite idea, lesson, activity... for publication in our newsletter.

Send submissions to:

Sheila McQuade, SDCTM Newsletter editor (smcquade2@sfcss.org).



“Learn more about your students, and help them learn more about themselves, too!”





Mark's Thoughts

Desmos is on South Dakota's assessment!

In case you haven't heard, there is a new embedded calculator on this year's South Dakota Smarter Balanced assessment. If this is news to you, I suggest the following like from the DOE:

https://s3.amazonaws.com/state-pdfs/SD_Desmos_Calculators.pdf. This link offers more information about the type of calculators embedded for each grade level as well as information regarding some of the accessibility options offered by Desmos.

I hope you are able to find time to use the Desmos calculators in your classroom between now and the testing period this spring. If you are looking to learn more about Desmos, I invite you to attend the SDCTM conference in Huron on February 8-10. I will be presenting a session on both days that focuses on learning how to use the Desmos calculators.

As always, if you ever have any questions regarding NCTM or Desmos, please feel free to contact me at Mark.Kreie@k12.sd.us. Have a great New Year!

Mark Kreie
NCTM Representative
Mark.Kreie@k12.sd.us

Musings from Crystal

As I write this issue's article, I am overseeing middle school kids run the concession stand during a basketball game. The kids are raising money to help buy themselves t-shirts for an upcoming event. As I sit here listening to them talk, it becomes apparent to me that they have a misunderstanding of profit, income, and expenses. They magically think that any money that they bring in, we get to keep. They do not think it is a big deal to taste test and sample the merchandise. They must believe that we somehow just acquired the snacks and no money is spent. They do not realize that the sampling of candy actually costs us money. Maybe in their own lives they do not have to think about expenses, because their parents do that for them. Therefore, I figured, I would turn this into a learning opportunity!

When I designed this activity, I wanted to make it as real world as possible. I took snapshots of lollipops from the Oriental Trading Company website. The prices are accurate, but I did throw in the \$5 shipping charge just for fun. This activity is for middle school students and you can tailor it to match your own students depending on their grade level. I designed it much like a SBAC Performance Task where it is very open-ended. It starts with a simple unit price question and then builds from there. I am also including one example from a student I have that is in an intervention class. Sometimes, the best lessons are analyzing what other students have done and their thought processes. Enjoy!

Crystal McMachen
President-Elect
Crystal.McMachen@k12.sd.us



"I hope you are able to find time to use the Desmos calculators in your classroom ..."



"I designed it much like a SBAC Performance Task where it is very open-ended."

continued

Name: _____ Date: _____ Period: _____

Valentine's Day Sucker Fundraiser

You are selling suckers during the Valentine's Day Dance to help raise money for an upcoming event. You are responsible for ordering the suckers and deciding on selling price. Student Council is going to loan you up to \$100 to order your suckers, but you have to pay them back. There is no tax, but shipping is a flat rate of \$5.00.



Heart-Shaped Ring Lollipops

IN-5/743

\$6.49

Per Dozen



5.0 out of 5



Strawberries 'N Cream Heart-Shaped Lollipops

IN-/K6250

\$6.49

38 Piece(s)



3.8 out of 5



Personalized Two Hearts Swirl Pops - Light Blue

IN-47/1515

\$13.99

24 Piece(s)



5.0 out of 5

What sucker(s) are you going to order? Why? What is the ordering price per sucker?

What should be your selling price? Explain your reasoning

How many suckers are you going to order? Why?

How many suckers do you have to sell to make a profit? Prove it using either a table, graph, or equation.

Name: _____

Date: 12-15-17 Period: 1

Valentine's Day Sucker Fundraiser

You are selling suckers during the Valentine's Day Dance to help raise money for an upcoming event. You are responsible for ordering the suckers and deciding on selling price. Student Council is going to loan you \$100 to order your suckers, but you have to pay them back. There is no tax, but shipping is a flat rate of \$5.00.



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24 Piece(s)



5.0 out of 5

What sucker(s) are you going to order? Why? What is the price per sucker?

- Strawberries 'N cream Heart-Shaped Lollipops.
- They have a better price for more lollipops
- .17¢ Per Lollipop

What should be your selling price? Explain your reasoning

50¢ per lollipop because it's better profit

How many suckers are you going to order? Why?

$$100 - 5 = 95 \div .17 = 558$$

How many suckers do you have to sell to make money? Prove it using either a table, graph, or equation.

200 to make

$$100/50 = 200$$



Space Grant "Research Experience for Teachers" (RET):

Please see the attached call-for-applications for the NASA South Dakota Space Grant-supported, **summer 2018 "Research Experience for Teachers" (RET)**. Feel free to post it on your SDSTA/SDCTM websites and forward to any full-time high school teachers of STEM-related subjects in South Dakota that may be interested. The program provides **\$8,000 fellowship awards** to two high school STEM teachers to participate in an 8-week research experience over summer 2018 under the mentorship of a university faculty or other professional researcher that works at an affiliate institution of the SD Space Grant Consortium. It is a great opportunity and was well-received by the four teachers who won the \$8,000 awards last summer.

RET 2018 Application & Instructions:

<http://sdspacegrant.sdsmt.edu/SDSGC-RET2018-Announcement.pdf>

Note: The single-page "Application Form" is downloadable in Word format at:

<http://sdspacegrant.sdsmt.edu/SDSGC-RET2018-ApplicationForm2018-Word.docx>

Kelly Lane Earth and Space Science Grant (\$5,000)

Science and math teachers at public, private, or tribal schools in South Dakota may now apply for the 12th annual "**Kelly Lane Earth and Space Science Grant**" provided by the NASA South Dakota Space Grant Consortium. This **\$5,000 grant** is awarded annually to a select science or math **teacher** of U.S. citizenship in South Dakota. The award seeks to improve science, technology, engineering, and mathematics (STEM) education in the state through the support of innovative programs in pre-college education. The application announcement for the 2018 grant is available at the following website. Preference will be given to applications focusing on topics pertaining to space science, earth science, and/or the use of geospatial technology, and to applicants who have not won this award in the past ten years. Applications must be received by **January 17, 2018**.

<http://sdspacegrant.sdsmt.edu/KellyLaneTeacherGrant.htm>

Daniel Swets Robotics Materials Award (\$6,000) - NASA South Dakota Space Grant

The NASA South Dakota Space Grant Consortium invites applications for the **2018 "Daniel Swets Robotics Materials Award"**. We anticipate providing **\$6,000** in award funding under this call-for-applications. This funding is open to South Dakota teachers and informal educators of U.S. citizenship who either have: A) taken robotics training or plan to take robotics training and want to begin new robotics programs and teams, or B) have sustained robotics programs/curriculum in their classrooms or at their schools.

Preference will be given to: 1) applications that would start new robotics programs and teams (e.g., at a school that didn't have one before), as opposed to augmenting existing robotics programs, 2) robotics programs at the Middle School level, and 3) applications from teachers/educators who have not won any prior robotics or other teacher awards provided by SD Space Grant in the past 12 years. The 2018 Application and Instructions are downloadable at the following website. Applications must be received by **January 17, 2018**.

<http://sdspacegrant.sdsmt.edu/DanSwetsRoboticsAward.html>

Questions and completed applications can be directed to:

Peggy Norris,
Deputy Director,
Education and Outreach,
Sanford Underground Research
Facility,
630 E. Summit St, Lead, SD 57754,

Email: pnorris@sanfordlab.org

Phone: [605-722-5049](tel:605-722-5049).

Thomas V. Durkin, CPG
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SD School of Mines & Technology
501 E. Saint Joseph Street
Rapid City, SD 57701
Phone: (605) 394-1975

Email: Thomas.Durkin@sdsmt.edu

Website: <http://sd.spacegrant.org>



Presidential Awards Nominations

**Know a Great K-6 Mathematics or Science Teacher?
Nominate him or her to receive the Presidential Teaching Award!**

We're looking for outstanding K-6 mathematics and science teachers for the 2018 Presidential Awards for Excellence in Mathematics and Science Teaching. The awards are sponsored by the White House and administered by the National Science Foundation.

Every year up to 108 National Awardees each receive a \$10,000 award, a paid trip for two to Washington, DC to attend a week-long series of networking opportunities and recognition events, and a special citation signed by the President of the United States.

The program has been accepting nominations of K-6 teachers for the nation's highest honor for mathematics and science teachers since October 1, 2017. Anyone can nominate an outstanding teacher. Teachers should submit completed application materials by May 1, 2018.

For more information, including nomination and application forms, please visit www.sdctm.org and click on the Presidential Awards link. Teachers may also visit the PAEMST website at www.paemst.org for more information. If you are attending the conference and would like to know more about the program, attend the "Showcase Your Teaching Practice and Win Money" session which will be held during the 9:30 time slot in Dakota C on Saturday. I hope to see you there!

Allen Hogie
SD PAEMST Mathematics Coordinator
Allen.Hogie@k12.sd.us



Wagner Outdoor Science Program to be on PBS

The Wagner outdoor science program will be featured on SDPBS on the Savor SD cooking show in February. (I think February 1st 8:30 — the February schedule for PBS is not yet available on-line.) The aquaponics system that was paid for by the Kelly Lane grant will be in the show. Our geodome with the big systems will also be featured. Since I acquired mine through the grant, we have learned how to build them and have put several smaller systems in our elementary rooms, thanks!! Here is a teaser for the show—I was so sick during the taping...but it still came out great:

<https://youtu.be/4UPMjYxW3xA?list=PLCvVBOK6IIHt-tbcd5RzpaJ034DzXHoho>

Carrie Tucek
Wagner



Marian Fillbrandt Scholarship

As the 2018 South Dakota Science Teachers Association and South Dakota Council of Math Teachers Joint Professional Conference approaches, I am already gearing up for the opportunity to spend time learning from fellow teachers and sharing ideas with each other. This conference is a great place to find resources, network, and give yourself fresh ideas that we all need in February, and I look forward to it every year. If you are lucky enough for your district to cover costs for your PD, congratulations! You can feel free to skip the rest of this article. If you aren't so lucky and are concerned about costs for this conference, read on.

First-year teachers, if you are unsure of whether or not this conference is for you, this is the year to try it out! The Jim Goehring and Ann Veitz Future Leaders Scholarship is available to all first-year math and science teachers in South Dakota. The application is available on the SDSTA and SDCTM websites (and on pg ,18 of this newsletter) and simply requires your building principal to verify that you are indeed a first-year teacher. Attendees will still need to register themselves for the conference, pay a small dues to join SDSTA or SDCTM, and travel to Huron, but the conference registration fee is covered, as long as the registration deadline is met. Registration is due by January 15, 2018.

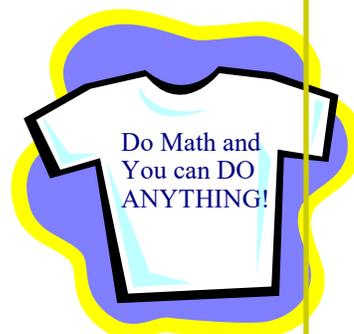
Second-year through fifth-year teachers are eligible to apply for the Marian Fillbrandt Scholarship. Fillbrandt graduated from SDSU with a mathematics degree and spent many years teaching math and science. She established the Fillbrandt endowment in order to help future math and science teachers. This scholarship provides a \$400 stipend to defray the costs of attending the conference, including registration, accommodations, and substitute teachers if districts will not provide one. This scholarship will be awarded to a number of recipients to allow teachers, particularly in rural areas, to spend time interacting with other teachers with similar interests. A link is available on the SDSTA and SDCTM websites to apply.

I hope that you will join your fellow math and science teachers at the annual conference for a weekend of valuable professional development. Visit the SDSTA and SDCTM websites for more information about the conference itself and funding opportunities.

Alison Bowers
8 - 12 Science
Hanson School District

Classy T-Shirt Day

When you pack for the conference, don't forget your favorite ~~Nerdy~~ Classy T-shirt! Again this year, we will all be sporting them on Saturday as we embrace our Math and Science Nerdiness!



"This conference is a great place to find resources, network, and give yourself fresh ideas..."



Beyond SohCahToa: Using “Handy Angles”

A Mnemonic for Remembering Trigonometric Special Angles

Students learn in different ways, and use of kinesthetic methods provides a well-established teaching/learning strategy. Using a physical reference (their hand) allows additional opportunities for students to access their learning. The “handy angles” should not replace conceptual understanding, but can provide a helpful tool for students once conceptual understanding has been achieved.

Isosceles right (45°-45°-90°) and 30°-60°-90° triangles belong to a special class of right triangles. Their sines cosines and tangents are frequently used to report “exact answers” rather than rounded approximations via calculator. Knowing the trigonometric functions of these special angles is helpful for efficient calculation when students encounter the “special angles” in Geometry and/or Trigonometry classes

Using “handy angles” provides quick and efficient access to these trigonometric functions, and by extension, their reference angles in other quadrants.

- Hold out your left hand. Your fingers represent the special angles represented in either degrees or radians. (See figure 1)
- The angles are designated moving up from your little finger:

0°, 30°, 45°, 60°, 90° (or their radian equivalents: 0, $\frac{\pi}{6}$, $\frac{\pi}{4}$, $\frac{\pi}{3}$, $\frac{\pi}{2}$).

- Imagine the number 2 in the palm of your hand. Make a fist twice to make sure it remains there. Now open your hand back up. The trigonometric functions are calculated by folding in the finger of the angle in question and noticing the number of fingers remaining above (*cosine*) or below (*sine*). You could remember this order by recalling that cosine and sine appear in alphabetical order. Use $\sqrt{\quad}$ when representing the number of fingers, and the 2 in the palm of your hand as the denominator.

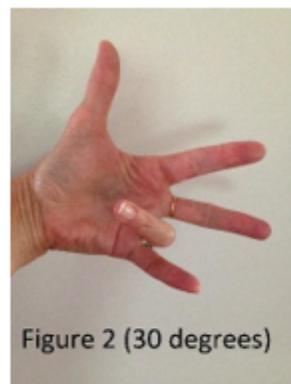
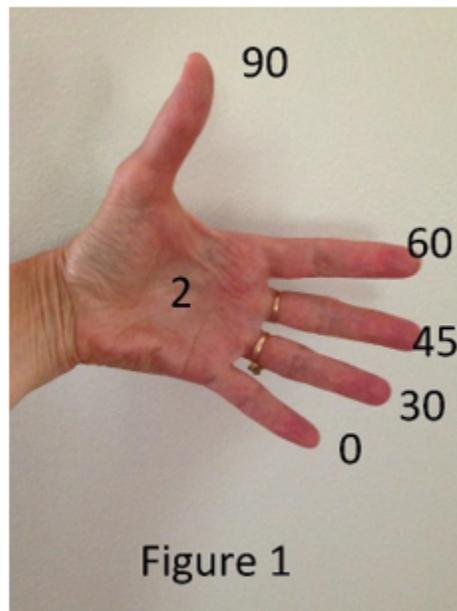


Figure 2 demonstrates:

$$\cos (30^\circ) = \frac{\sqrt{3}}{2}$$

(note the three fingers above)

$$\sin (30^\circ) = \frac{\sqrt{1}}{2} \text{ which equals } \frac{1}{2}$$

(note the one finger below)

Figure 3 demonstrates:

$$\cos (45^\circ) = \frac{\sqrt{2}}{2} \text{ (note the two fingers above)}$$

$$\sin (45^\circ) = \frac{\sqrt{2}}{2} \text{ (note the two fingers below)}$$



continued



Beyond SohCahToa: Using “Handy Angles”

A Mnemonic for Remembering Trigonometric Special Angles

Use the same method for 0° , 60° , or 90° by folding in the appropriate finger. Remember to use $\sqrt{\quad}$ when counting number of fingers above/below and the 2 in the palm of your hand as the denominator.

Tangents can be viewed by first locating the correct angle and then turning your hand over to look at the back of your hand. See figures 4 and 5. Note that your fingers are now oriented in a sin/cos relationship.



Fig 4 (tan30)

Figure 4 demonstrates:

$$\tan(30^\circ) = \frac{\sqrt{1}}{\sqrt{3}} \text{ which equals } \frac{1}{\sqrt{3}}$$

Figure 5 demonstrates:

$$\tan(45^\circ) = \frac{\sqrt{2}}{\sqrt{2}} = 1$$



Fig. 5 (tan45)

Instead of memorizing a table of special values, students can find exact values for sine, cosine, and tangent by using “handy angles.” By considering reference angles in other quadrants, they now have access to exact values for 135° , 300° , 225° , etc. Try it. Your students will thank you.

CCSSM F.TF.3+ Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi-x$, $\pi+x$, and $2\pi-x$ in terms of their values for x , where x is any real number.

Cindy Kroon

Montrose High School

cindy.kroon@k12.sd.us

Quadrilateral Properties Review

At the end of the chapter in which we study polygons, quadrilaterals and special quadrilaterals, I use the chart on page 17 as a review. Students work in small groups without their notes/books. They are instructed that they may discuss whether or not each square should be marked, but they do not have to agree. The mathematical conversations that take place are amazing! If you choose to grade the chart, try placing your key on top, using binder clips to clip them together and then use a nail or a drill press to put holes through the entire stack. If I score them, I make each square worth $\frac{1}{4}$ point.

Sheila McQuade

O’Gorman High School

smcquade2@sfcss.org

“GOEHRING/VGKTZ LEADERSHIP SCHOLARSHIP”

“The Goehring/Veitz Leadership Scholarship” has been established to encourage new teachers of math and science to become professionally involved on the state level. The scholarship, which is good for a free one or two day registration at the Joint Conference of the South Dakota Council of Teachers of Mathematics and the South Dakota Science Teachers Association, is available to any teacher who meets each of the following criteria:

- Is a K-12 teacher of math or science who is in the first year of teaching in SD
- Is a member of SDCTM and/or SDSTA Applicants must pay their own dues to the chosen organization.

The application process is simple. Fill out the form below, have it signed by the building principal, and mail it to Steve Caron along with the regular conference registration form which is available at www.sdctm.org.

APPLICATION
“GOEHRING/VGKTZ LEADERSHIP SCHOLARSHIP”

Name:

School District:

Teaching Assignment:

Membership Information:

_____ I am already a member of SDCTM SDSTA (Circle one or both)

_____ I am joining SDCTM and/or SDSTA (Circle one or both)

I am enclosing a check for

_____ \$5.00 for Elementary Math and/or \$5.00 for Elementary Science

_____ \$20.00 for MS/HS Math and/or \$20.00 for MS/HS Science

<p>(Name) _____ is in his/her first year of teaching in SD at _____ School District during the _____ school year and is thus eligible for ‘The Goehring/Veitz Leadership Scholarship.’</p> <p>Signed: _____, Building Principal</p>

2018 SDCTM/SDSTA JOINT CONFERENCE

Conference information and program booklets will be available online at www.sdctm.org and www.sdsta.org

ADVANCE REGISTRATION

Crossroads Events Center, Huron South Dakota
 February 8-10, 2018 1-800-876-5858

*Download this form. Please print clearly. **Postmark by January 15, 2018.** After this date, please register on-site (+\$25).*

Name _____
 Permanent Address _____
 City _____ State _____ Zip _____
 School/District _____ E-mail _____
 Home phone _____ School Phone _____

Please check the appropriate categories for membership, conference registration, and payment.

1. SDCTM/SDSTA MEMBERSHIP(s) and DUES

Please check the appropriate categories. You may join one, both, or neither organization.

Begin/renew SDCTM (math) for one year	Begin/renew SDSTA (science) for one year
_____ Elementary \$5	_____ Elementary \$5
_____ Middle School \$20	_____ Middle School \$20
_____ High School \$20	_____ High School \$20
_____ Post-Secondary \$20	_____ Post-Secondary \$20
_____ Student \$5	_____ Student \$5
_____ Retired \$5	_____ Retired \$5
_____ Other \$20	_____ Other \$20

NOTE: First year teachers are eligible for a scholarship providing a free registration. See www.sdctm.org for details.

2. CONFERENCE ADVANCE REGISTRATION

On-site (late) registration will be available: additional \$25 cost.

*Please check the appropriate categories. Noon luncheon is included for each day that you register.
 NOTE: The Friday night banquet is NOT included. Banquet tickets may be purchased for \$25 each.*

I will attend the conference on (check one): _____ Friday _____ Saturday _____ Both days

SDCTM or SDSTA Member	Non-Member	Student Member
_____ One day \$50	_____ One day \$100	_____ One day \$15
_____ Two days \$75	_____ Two days \$125	_____ Two days \$25

College credit will be available; information/registration will be available at the conference registration table.

3. PAYMENT: By Check Only

*Make checks payable to SDCTM.
 SDCTM does NOT accept purchase orders.
 To use credit card, you **must** register and pay ONLINE:*

Membership(s) total	\$ _____
Registration	\$ _____
Friday Night Banquet (\$25 each)	\$ _____
On-site Late Registration Fee (+\$25)	\$ _____

TOTAL ENCLOSED \$ _____

Requests for refunds must be received by January 20, 2018

4. SEND THIS FORM WITH PAYMENT

Steve Caron
 907 South 16th Street School phone (605) 725-8208
 Aberdeen, SD 57401 Home phone (605) 226-2292

Email questions to: steve.caron@k12.sd.us

*Advance registration must be postmarked by **January 20, 2018.**
 After this date, please register on-site (Additional \$25 fee).*

Please check here if you have also submitted a speaker proposal form for the 2018 Conference.



Print a copy of this form. Mail with check payable to SDCTM to:

Jay Berglund
204 S. Exene Strert
Gettysburg, SD 57442

Name _____

School Name _____

Subjects or Grades Taught _____

Addresses

Home _____

School _____

Mailing Address: _____ Home _____ School _____

Home Phone _____

School Phone _____

Fax Number _____

E-mail _____

Membership categories (Check only one)

- _____ Elementary School \$5.00
- _____ Middle School / Junior High \$20.00
- _____ High School \$20.00
- _____ Post Secondary \$20.00
- _____ Retired \$5.00
- _____ Student \$5.00
- _____ Other \$20.00

We now offer the option to use PayPal to pay your dues for a minimal processing fee of \$1.00. The processing fee will cover the processing fees incurred by SDCTM and fees charged for having checks cut by PayPal.

Instructions can be found online at:
<http://www.sdctm.org/joinsdctm.htm>



SDCTM Newsletter
C/o Sheila McQuade
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www.sdctm.org